

APPENDIX A

APPROVED
FOR CONSTRUCTION



SITE VICINITY MAP
SOURCE: USGS

MONTANA DEPARTMENT OF FISH, WILDLIFE, & PARKS

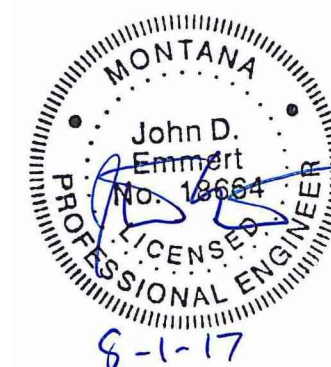
FRENCH CREEK FISH BARRIER MOUNT HAGGIN WILDLIFE MANAGEMENT AREA

PREPARED BY

PIONEER TECHNICAL SERVICES, INC.
DATE: 08/01/2017

SHEET INDEX

SHEET NO.	DESCRIPTION
1	COVER SHEET AND INDEX
2	LEGEND AND ABBREVIATIONS
3	SITE ACCESS PLAN
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8	STRUCTURAL DETAILS
9	STRUCTURAL DETAILS
10	BACKFILL DETAILS



ABBREVIATIONS

APPROVED
FOR CONSTRUCTION

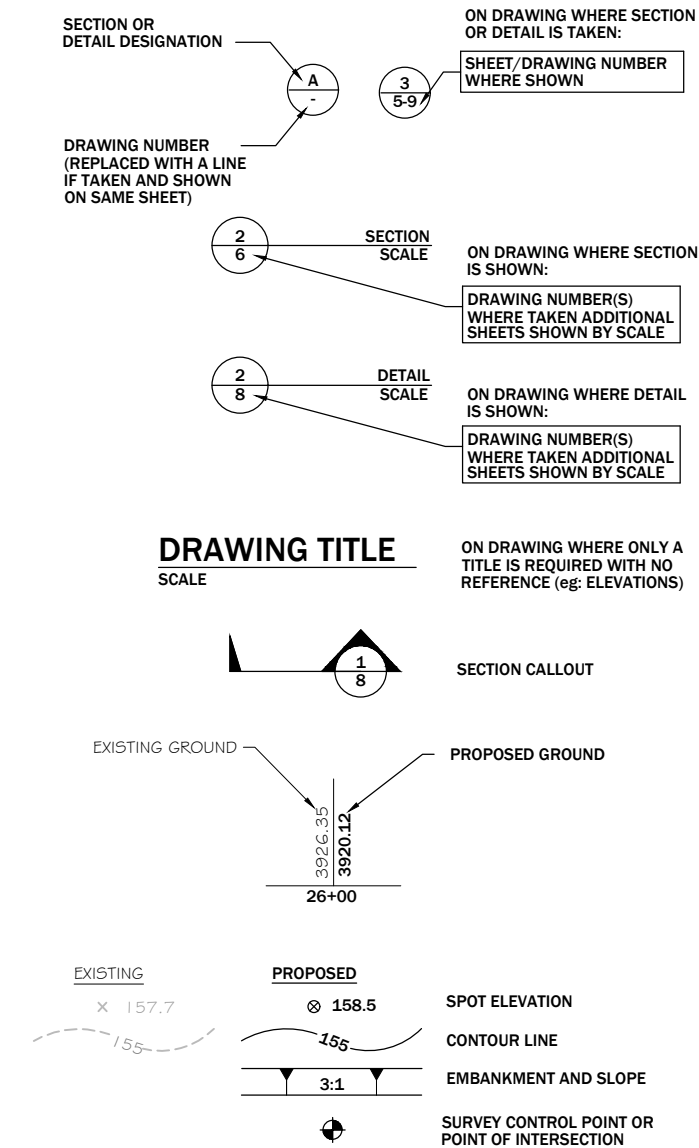
AB	ANCHOR BOLT, ABOVE	FLG	FLANGE	PRES	PRESSURE
ABDN	ABANDON	FL	FLOOR	PRI	PRIMARY
AC	ASPHALTIC CONCRETE	FLEX	FLEXIBLE	PROP	PROPERTY
AD	AREA DRAIN	FNSH	FINISH	PSF	POUNDS PER SQUARE FOOT
ADDI	ADDITIONAL	FOB	FLAT ON BOTTOM	PSI	POUNDS PER SQUARE INCH
ADJ	ADJACENT	FP	FIELD PANEL	PSIG	POUNDS PER SQUARE INCH, GAUGE
AGGR	AGGREGATE	FPL	FROST PROTECTION LAYER	PT	POINT OF TANGENCY
AHR	ANCHOR	FPM	FEET PER MINUTE	PT	PRESSURE TREATED
AJ	ADJUSTABLE	FT	FOOT OR FEET	PVI	POINT OF VERTICAL INTERSECTION
APPROX	APPROXIMATE	FWD	FORWARD	PVMT	PAVEMENT
APVD	APPROVED	G, GND	GROUND	PVT	POINT OF VERTICAL TANGENCY
AUTO	AUTOMATIC	GA	GAUGE	R OR RAD	RADIUS
AUX	AUXILIARY	GAL	GALLON	RC	REINFORCED CONCRETE
AVG	AVERAGE	GALV	GALVANIZED	REDUCR	REDUCER
@	AT	GC	GROOVED COUPLING	REF	REFER OR REFERENCE
BETW	BETWEEN	GCL	GEOSYNTHETIC CLAY LINER	REINF	REINFORCED, REINFORCING, REINFORCE
BF	BLIND FLANGE, BOTTOM FACE	GVL	GRAVEL	REQD	REQUIRED
BG	BELOW GRADE	HDPE	HIGH DENSITY POLYETHYLENE	RH	RIGHT HAND
BLDG	BUILDING	HH	HANDHOLE	RHR	RIGHT HAND REVERSE
BLK	BLOCK	HORIZ	HORIZONTAL	RPE	REINFORCED POLYETHYLENE
BM	BEAM, BENCHMARK	HP	HORSEPOWER	RST	REINFORCING STEEL
BOT	BOTTOM	HPT	HIGH POINT	RT	RIGHT
BRG	BEARING	HWL	HIGH WATER LEVEL	RTN	RETURN
BRKR	BREAKER	IE	INVERT ELEVATION	R/W	RIGHT OF WAY
BVC	BEGINNING OF VERTICAL CURVE	I.F.	INSIDE FACE	S	SWITCH
C	CONDUIT, CASEMENT	IN	INCH(ES)	SB	SEDIMENT BASIN
C TO C	CENTER TO CENTER	INVT	INVERT	SCHED	SCHEDULE
CAB	CABINET	IP	INLET PROTECTION	SEC	SECONDARY
CB	CATCH BASIN, CIRCUIT BREAKER	IRRIG	IRRIGATION	SED	SEDIMENTATION
CC	CONTROL CABLE	JB	JUNCTION BOX	SH	SHEET
CCL	COMPACTED CLAY LAYER	JCT	JUNCTION	SIM	SIMILAR
CCP	CENTRAL CONTROL PANEL	JT	JOINT	SPEC, SPECS	SPECIFICATIONS
CCS	CENTRAL CONTROL SYSTEM	L	ANGLE, LENGTH	SQ	SQUARE
CDN	COMPOSITE DRAINAGE NET	LB(S)	POUND(S)	SQ FT	SQUARE FOOT, FEET
CIP	CAST IN PLACE	LDS	LEAK DETECTION SYSTEM	SQ IN	SQUARE INCH
CIP	CULVERT INLET PROTECTION	LF	LINEAR FEET	ST	STRAIGHT
CJ	CONSTRUCTION JOINT	LG	LONG	STA	STATION
CL	CENTERLINE	LONG	LONGITUDINAL	STD	STANDARD
CLSF	CONTROLLED LOW STRENGTH FILL	LP	LIGHT POLE	STL	STEEL
CLR	CLEAR, CLEARANCE	LPT	LOW POINT	STRUCT	STRUCTURE
CMP	CORRUGATED METAL PIPE	LR	LONG RADIUS	T&B	TOP AND BOTTOM
CO	CLEANOUT, CARBON MONOXIDE	LT	LEFT	TAN	TANGENT
CONC	CONCRETE	LTG, LTS	LIGHTS OR LIGHTING	TBC	TEMPORARY BYPASS CHANNEL
CONN	CONNECTION	MATL	MATERIAL	TECH	TECHNICAL
CONSTR	CONSTRUCTION	MAX	MAXIMUM	TEL	TELEPHONE
CONT	CONTINUED, CONTINUATION	MECH	MECHANICAL	TEMP	TEMPORARY, TEMPERATURE
COORD	COORDINATE	MFD	MANUFACTURED	THK	THICKNESS
CP	CONTROL POINT	MFR	MANUFACTURER	THRU	THROUGH
CRS	COLD ROLLED STEEL	MH	MANHOLE, MOUNTING HEIGHT	TOC	TOP OF CONCRETE
CRS	CONSTRUCTION ROAD STABILIZATION	MIN	MINIMUM	TOS	TOP OF SLAB
CTR	CENTER	MISC	MISCELLANEOUS	TOW	TOP OF WALL
CTR'D	CENTERED	MS	MANUFACTURER'S STANDARD	TP	TURNING POINT
CU	CUBIC	MT	MOUNT	TRANSV	TRANSVERSE
CU FT	CUBIC FOOT	MTD	MOUNTED	TX	TRANSFORMER
CU IN	CUBIC INCH	MTG	MOUNTING	TYP	TYPICAL
CY, CU YD	CUBIC YARD	MU	MULCHING	UON	UNLESS OTHERWISE NOTED
DET	DETAIL	MWS	MAXIMUM WATER SURFACE	VC	VERTICAL CURVE
DIA	DIAMETER	N	NORTH	VERT	VERTICAL
DIAG	DIAGONAL	NA	NOT APPLICABLE	VPC	POINT OF VERTICAL CURVATURE
DIR	DIRECTION	NEUT	NEUTRAL	VPI	POINT OF VERTICAL INTERSECTION
DISCH	DISCHARGE	NG	NATURAL GAS	VPT	POINT OF VERTICAL TANGENT
DWG	DRAWING	NGVD	NATIONAL GEODETIC VERTICAL DATUM	W	WEST
△	DELTA	NIC	NOT IN CONTRACT	W/	WITH
E	EAST, EMPTY	N.O.	NORMALLY OPEN		
EA	EACH	NO., #	NUMBER		
EF	EACH FACE	NOM	NOMINAL		
EL	ELEVATION	N-S	NORTH - SOUTH		
ELB	ELBOW	NTS	NOT TO SCALE		
ELC	ELECTRICAL LOAD CENTER	OC	ON CENTER		
ELEC	ELECTRIC, ELECTRICAL	OD	OUTSIDE DIAMETER		
ENGR	ENGINEER	OF	OVERFLOW		
EQL SP	EQUALLY SPACED	O.F.	OUTSIDE FACE		
EQPT	EQUIPMENT	OPNG	OPENING		
ESC	EROSION AND SEDIMENT CONTROL	OPP	OPPOSITE		
EVC	END OF VERTICAL CURVE	OZ	OUNCE		
EW	EACH WAY	PC	POINT OF CURVE		
EXP	EXPANSION, EXPOSED	PCF	POUNDS PER CUBIC FOOT		
EXP AB	EXPANSION ANCHOR BOLT	PI	POINT OF INTERSECTION		
EXP JT	EXPANSION JOINT	PJF	PREMOULDED JOINT FILLER		
EXST, EXIST	EXISTING	PL	PROPERTY LINE		
EXT	EXTERIOR	PLYWD	PLYWOOD		
FC	FLEXIBLE CONDUIT/ CONNECTOR	PMP	PUMP		
FCA	FLANGED COUPLING ADAPTER	PNL	PANEL		
FDN	FOUNDATION	POE	POINT OF ENDING		
FG	FINISH GRADE	PP	POWER POLE		
FHY	FIRE HYDRANT	PR	PAIR		
FIG	FIGURE	PRC	POINT OF REVERSE CURVE		
FL	FLOW LINE	PRCST	PRECAST		

FLG	FLANGE	PRES	PRESSURE
FL	FLOOR	PRI	PRIMARY
FLEX	FLEXIBLE	PROP	PROPERTY
FNSH	FINISH	PSF	POUNDS PER SQUARE FOOT
FOB	FLAT ON BOTTOM	PSI	POUNDS PER SQUARE INCH
FP	FIELD PANEL	PSIG	POUNDS PER SQUARE INCH, GAUGE
FPL	FROST PROTECTION LAYER	PT	POINT OF TANGENCY
FPM	FEET PER MINUTE	PT	PRESSURE TREATED
FT	FOOT OR FEET	PVI	POINT OF VERTICAL INTERSECTION
FWD	FORWARD	PVMT	PAVEMENT
G, GND	GROUND	PVT	POINT OF VERTICAL TANGENCY
GA	GAUGE	R OR RAD	RADIUS
GAL	GALLON	RC	REINFORCED CONCRETE
GALV	GALVANIZED	REDUCR	REDUCER
GC	GROOVED COUPLING	REF	REFER OR REFERENCE
GCL	GEOSYNTHETIC CLAY LINER	REINF	REINFORCED, REINFORCING, REINFORCE
GVL	GRAVEL	REQD	REQUIRED
HDPE	HIGH DENSITY POLYETHYLENE	RH	RIGHT HAND
HH	HANDHOLE	RHR	RIGHT HAND REVERSE
HORIZ	HORIZONTAL	RPE	REINFORCED POLYETHYLENE
HP	HORSEPOWER	RST	REINFORCING STEEL
HPT	HIGH POINT	RT	RIGHT
HWL	HIGH WATER LEVEL	RTN	RETURN
IE	INVERT ELEVATION	R/W	RIGHT OF WAY
I.F.	INSIDE FACE	S	SWITCH
IN	INCH(ES)	SB	SEDIMENT BASIN
INVT	INVERT	SCHED	SCHEDULE
IP	INLET PROTECTION	SEC	SECONDARY
IRRIG	IRRIGATION	SED	SEDIMENTATION
JB	JUNCTION BOX	SH	SHEET
JCT	JUNCTION	SIM	SIMILAR
JT	JOINT	SPEC, SPECS	SPECIFICATIONS
L	ANGLE, LENGTH	SQ	SQUARE
LB(S)	POUND(S)	SQ FT	SQUARE FOOT, FEET
LDS	LEAK DETECTION SYSTEM	SQ IN	SQUARE INCH
LF	LINEAR FEET	ST	STRAIGHT
LG	LONG	STA	STATION
LONG	LONGITUDINAL	STD	STANDARD
LP	LIGHT POLE	STL	STEEL
LPT	LOW POINT	STRUCT	STRUCTURE
LR	LONG RADIUS	T&B	TOP AND BOTTOM
LT	LEFT	TAN	TANGENT
LTG, LTS	LIGHTS OR LIGHTING	TBC	TEMPORARY BYPASS CHANNEL
MATL	MATERIAL	TECH	TECHNICAL
MAX	MAXIMUM	TEL	TELEPHONE
MECH	MECHANICAL	TEMP	TEMPORARY, TEMPERATURE
MFD	MANUFACTURED	THK	THICKNESS
MFR	MANUFACTURER	THRU	THROUGH
MH	MANHOLE, MOUNTING HEIGHT	TOC	TOP OF CONCRETE
MIN	MINIMUM	TOS	TOP OF SLAB
MISC	MISCELLANEOUS	TOW	TOP OF WALL
MS	MANUFACTURER'S STANDARD	TP	TURNING POINT
MT	MOUNT	TRANSV	TRANSVERSE
MTD	MOUNTED	TX	TRANSFORMER
MTG	MOUNTING	TYP	TYPICAL
MU	MULCHING	UON	UNLESS OTHERWISE NOTED
MWS	MAXIMUM WATER SURFACE	VC	VERTICAL CURVE
N	NORTH	VERT	VERTICAL
NA	NOT APPLICABLE	VPC	POINT OF VERTICAL CURVATURE
NEUT	NEUTRAL	VPI	POINT OF VERTICAL INTERSECTION
NG	NATURAL GAS	VPT	POINT OF VERTICAL TANGENT
NGVD	NATIONAL GEODETIC VERTICAL DATUM	W	WEST
NIC	NOT IN CONTRACT	W/	WITH
N.O.	NORMALLY OPEN		
NO., #	NUMBER		
NOM	NOMINAL		
N-S	NORTH - SOUTH		
NTS	NOT TO SCALE		
OC	ON CENTER		
OD	OUTSIDE DIAMETER		
OF	OVERFLOW		
O.F.	OUTSIDE FACE		
OPNG	OPENING		
OPP	OPPOSITE		
OZ	OUNCE		
PC	POINT OF CURVE		
PCF	POUNDS PER CUBIC FOOT		
PI	POINT OF INTERSECTION		
PJF	PREMOULDED JOINT FILLER		
PL	PROPERTY LINE		
PLYWD	PLYWOOD		
PMP	PUMP		
PNL	PANEL		
POE	POINT OF ENDING		
PP	POWER POLE		
PR	PAIR		
PRC	POINT OF REVERSE CURVE		
PRCST	PRECAST		

NOTES:

1. CONTACT ENGINEER FOR ABBREVIATIONS USED BUT NOT SHOWN ON THIS DRAWING.

LEGEND



GENERAL SITE

1. SOURCE OF TOPOGRAPHY SHOWN ON THE CIVIL PLANS ARE FROM LIMITED SURVEY DATA. EXISTING CONDITIONS MAY VARY FROM THOSE SHOWN ON THESE PLANS. THE CONTRACTOR SHALL VERIFY EXISTING CONDITIONS AND ADJUST WORK PLAN ACCORDINGLY PRIOR TO BEGINNING CONSTRUCTION.
2. EXISTING TOPOGRAPHY, STRUCTURES, AND SITE FEATURES ARE SHOWN SCREENED AND/OR LIGHT-LINED. NEW FINISH GRADE, STRUCTURES, AND SITE FEATURES ARE SHOWN HEAVY-LINED.
3. HORIZONTAL DATUM: NAD 83, MONTANA STATE PLANE COORDINATE SYSTEM, INTERNATIONAL FEET.
4. VERTICAL DATUM: N.A.V.D. 88, U.S. SURVEY FEET.
5. MAINTAIN, RELOCATE, OR REPLACE EXISTING SURVEY MONUMENTS, CONTROL POINTS, AND STAKES WHICH ARE DISTURBED OR DESTROYED. PERFORM THE WORK TO PRODUCE THE SAME LEVEL OF ACCURACY AS THE ORIGINAL MONUMENT(S) IN A TIMELY MANNER, AND AT THE CONTRACTOR'S EXPENSE.
6. STAGING AREA SHALL BE FOR CONTRACTOR'S EMPLOYEE PARKING, CONTRACTOR'S TRAILERS AND ON-SITE STORAGE OF MATERIALS.
7. PROVIDE TEMPORARY FENCING AS NECESSARY TO MAINTAIN SECURITY AT ALL TIMES.
8. ELEVATIONS GIVEN ARE TO FINISH GRADE UNLESS OTHERWISE NOTED.
9. SLOPE UNIFORMLY BETWEEN CONTOURS AND SPOT ELEVATIONS SHOWN.
10. EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE MAINTAINED AND INSPECTED AS STATED IN THE APPROVED EROSION AND SEDIMENTATION PLAN APPROVED IN THE STORMWATER DISCHARGE PERMIT.
11. ALL CONTRACTORS AND SUBCONTRACTORS SHALL COMPLY WITH THE FIELD SAFETY INSTRUCTIONS APPROVED (FSI) FOR THIS SITE AT ALL TIMES.
12. EXISTING SITE DRAINAGE FLOW PATTERNS/DIRECTIONS SHALL BE MAINTAINED UNLESS OTHERWISE INDICATED ON THE PLANS.
13. CONSTRUCTION ACTIVITY BY OTHERS MAY IMPACT THE WORK CONTEMPLATED WITHIN THIS PACKAGE. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY IF A CONFLICT ARISES RELATING TO THE PROGRESS OF THE WORK. FINAL COORDINATION/RESOLUTION OF SUCH CONFLICTS SHALL BE THE RESPONSIBILITY OF THE CONTRACTORS INVOLVED.
14. EXISTING FEATURES AND UTILITIES ARE SHOWN ON THE PLANS BASED UPON INFORMATION AVAILABLE AT THE TIME THE PLANS WERE PREPARED. SHOULD UNIDENTIFIED UTILITY OR SERVICE ELEMENTS BE ENCOUNTERED, NOTIFY THE ENGINEER AND THE APPROPRIATE UTILITY OWNER IMMEDIATELY.
15. ACCESS TO THE GENERAL SITE, AND TO SPECIFIC WORK AREAS SHALL BE LIMITED TO THE LOCATIONS SHOWN ON THE PLANS.
16. WATER FOR CONSTRUCTION ACTIVITIES SHALL BE OBTAINED BY THE CONTRACTOR AT THEIR SOLE EXPENSE. ANY AND ALL PERMITS REQUIRED SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

GENERAL NOTE:

1. THIS IS A STANDARD LEGEND SHEET. THEREFORE, NOT ALL OF THE INFORMATION SHOWN MAY BE USED ON THIS PROJECT.

REVISION:	DATE:	BY:	DESC:

DRAWN BY:	JJJ
DESIGNED BY:	JJJ
CHECKED BY:	JDE
APPROVED BY:	GEA
PROJECT NO.:	
DATE:	08/01/2017

DISPLAYED AS:	
COORD SYS/ZONE:	
DATUM:	
UNITS:	
SOURCE:	PIONEER

SCALE IN FEET
0

MTFWP FRENCH CREEK FISH BARRIER

FRENCH CREEK LEGEND AND ABBREVIATIONS

PIONEER TECHNICAL SERVICES, INC. 106 PRONGHORN TRAIL, SUITE A BOZEMAN, MONTANA 59718 (406) 388-8578

SHEET 2

APPROVED
FOR CONSTRUCTION

MILL CREEK ROAD

2.6 MILES TO
HIGHWAY 43

MILL CREEK ROAD

CONSTRUCTION ACCESS
FROM MILL CREEK ROAD

22.0 MILES TO
ANACONDA

PROPOSED FISH
BARRIER LOCATION

BASEFLOW
INUNDATION EXTENTS

FRENCH CREEK

FRENCH CREEK

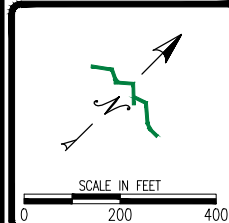
NOTES:

1. CONTRACTOR RESPONSIBLE FOR TEMPORARY ACCESS ROAD CONSTRUCTION AND RECLAMATION.
NO RECLAMATION IS REQUIRED WITHIN THE BASEFLOW INUNDATION EXTENTS.

REVISION:	DATE:	BY:	DESC:

DRAWN BY:	JBU
DESIGNED BY:	JDE
CHECKED BY:	JDE
APPROVED BY:	GEA
PROJECT NO:	
DATE:	08/01/2017

DISPLAYED AS:	
COORD SYS/ZONE:	MSP NAD83
DATUM:	NAVD88
UNITS:	INTL FEET
SOURCE:	PIONEER



MTFWP
FRENCH CREEK
FISH BARRIER

FRENCH CREEK
FISH BARRIER
SITE ACCESS PLAN

PIONEER
TECHNICAL SERVICES, INC.
106 PRONGHORN TRAIL, SUITE A
BOZEMAN, MONTANA 59718
(406) 388-8578

SHEET
3

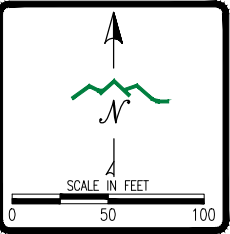
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4	S-CP-80D	629958.69	1054233.53	5918.15
5	S-CP-80D	630071.29	1054299.98	5932.20



REVISION:	DATE:	BY:	DESC:

DRAWN BY:	JJJ
DESIGNED BY:	JDE
CHECKED BY:	JDE
APPROVED BY:	GEA
PROJECT NO:	
DATE:	08/01/2017

DISPLAYED AS:	
COORD SYS/ZONE:	MSP NAD83
DATUM:	NAVDS8
UNITS:	INT. FEET
SOURCE:	PIONEER



MTFWP
FRENCH CREEK
FISH BARRIER

FRENCH CREEK
FISH BARRIER
SITE PLAN

**PIONEER**
TECHNICAL SERVICES, INC.
106 PRONGHORN TRAIL, SUITE A
BOZEMAN, MONTANA 59718
(406) 388-8578

SHEET
4

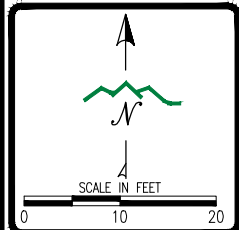
APPROVED
FOR CONSTRUCTION

PROPOSED STRUCTURE ENGINEERS ESTIMATE	
CONCRETE VOLUME (CY)	
CONCRETE	136

REVISION:	DATE:	BY:	DESC:

DRAWN BY:	JJJ
DESIGNED BY:	JDE
CHECKED BY:	JDE
APPROVED BY:	GEA
PROJECT NO.:	
DATE:	08/01/2017

DISPLAYED AS:	
COORD SYS/ZONE:	MSP NAD83
DATUM:	NAVD88
UNITS:	INT. FEET
SOURCE:	PIONEER



MTFWP
FRENCH CREEK
FISH BARRIER

FRENCH CREEK
FISH BARRIER
STRUCTURE PLAN

PIONEER
TECHNICAL SERVICES, INC.
106 PRONGHORN TRAIL, SUITE A
BOZEMAN, MONTANA 59718
(406) 388-8578

SHEET
5



APPROVED
FOR CONSTRUCTION

REVISION:	DATE:	BY:	DESC:

DRAWN BY:	JJJ
DESIGNED BY:	JDE
CHECKED BY:	JDE
APPROVED BY:	GEA
PROJECT NO:	
DATE:	08/01/2017

DISPLAYED AS:	
COORD SYS/ZONE:	NA
DATUM:	NA
UNITS:	FEET
SOURCE:	PIONEER

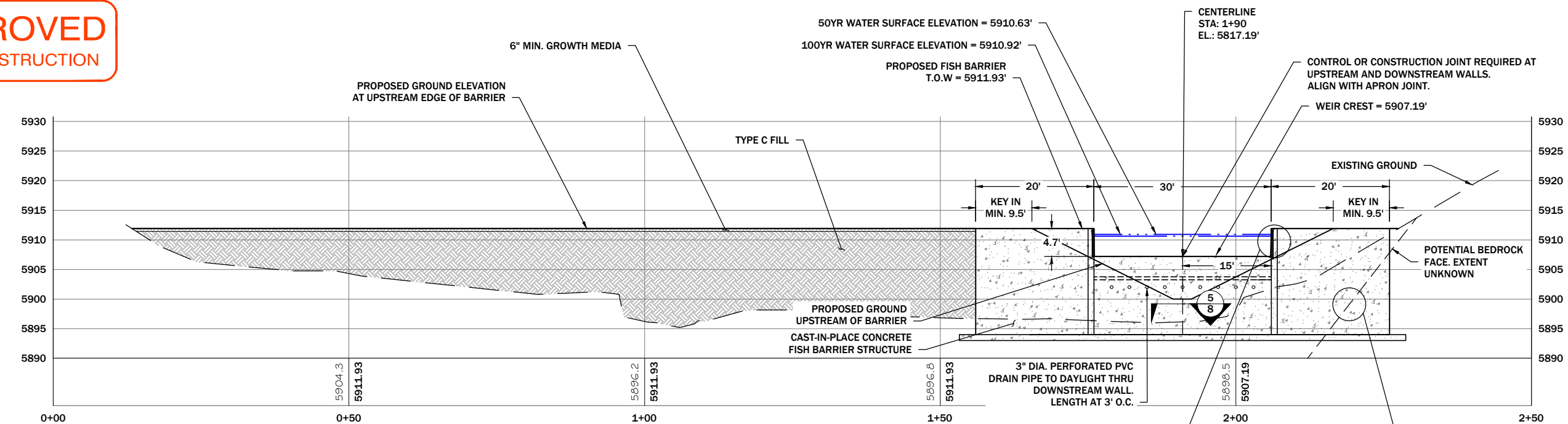
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MTFWP
FRENCH CREEK
FISH BARRIER

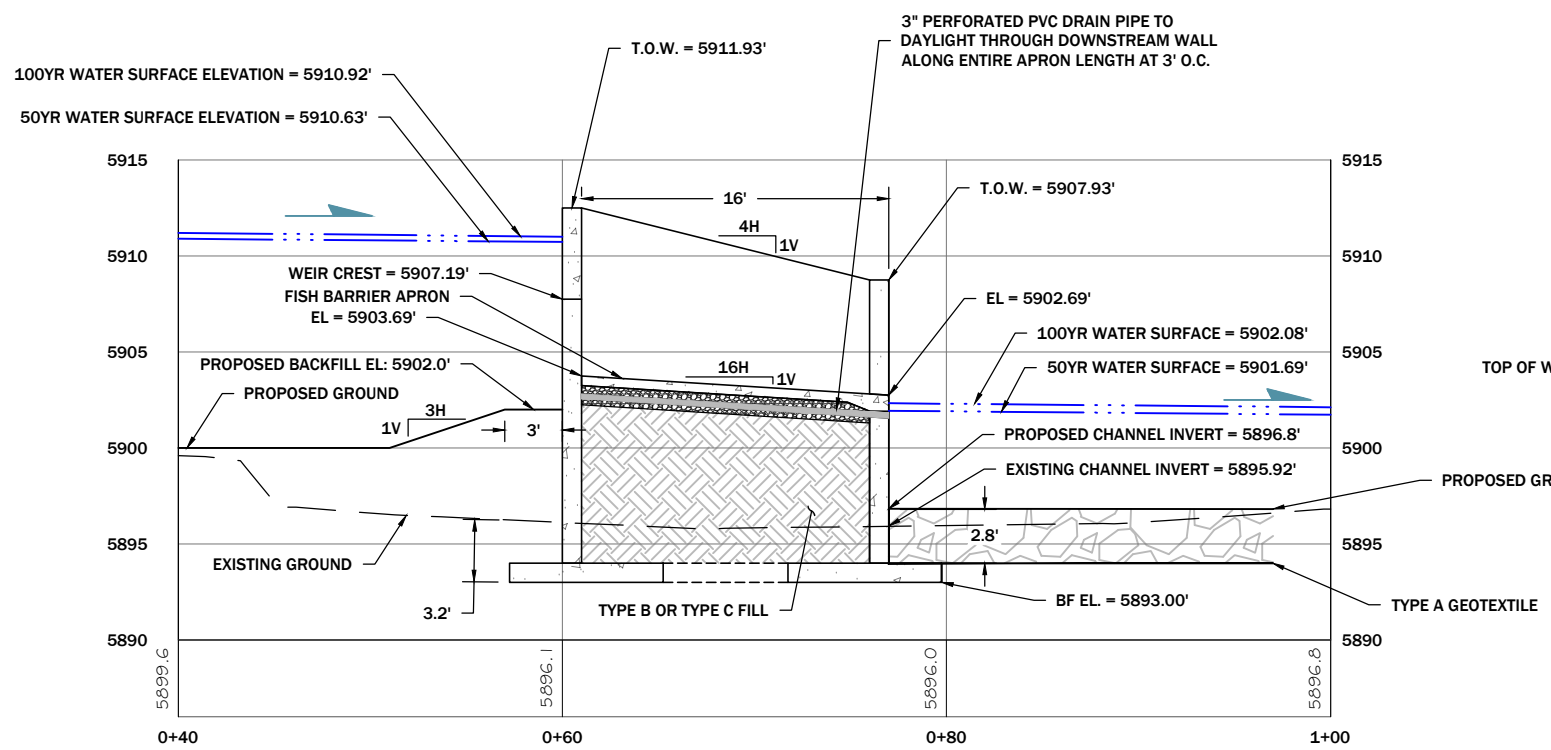
FRENCH CREEK
FISH BARRIER
CROSS SECTION
AND PROFILE

PIONEER
TECHNICAL SERVICES, INC.
106 PRONGHORN TRAIL, SUITE A
BOZEMAN, MONTANA 59718
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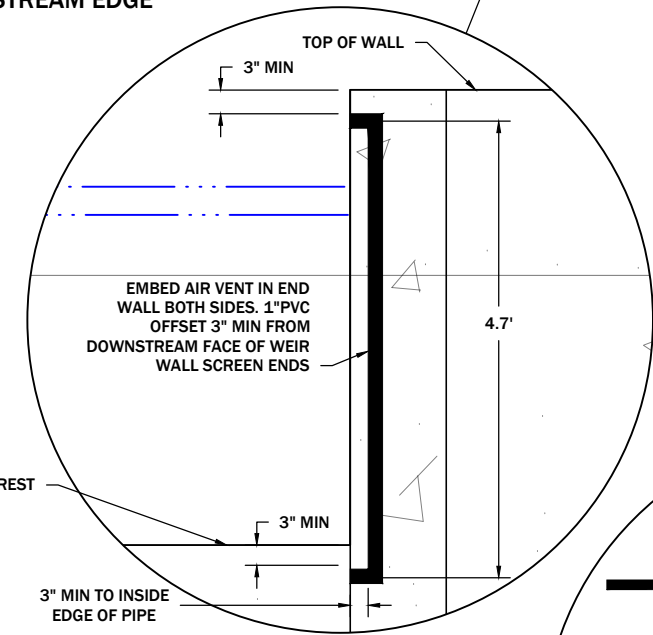
SHEET
6



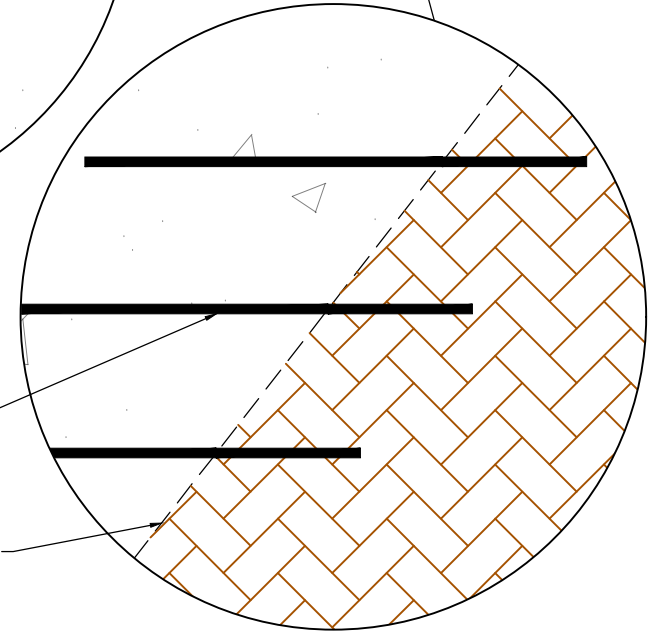
1 FISH BARRIER AT UPSTREAM EDGE
5 SECTION
SCALE: 1"=10'



2 FISH BARRIER AT CENTERLINE
5 PROFILE
SCALE: 1"=10'



3 AIR VENT
6 TYPICAL DETAIL
SCALE: 1/2" = 1'



4 BEDROCK INTERFACE
6 TYPICAL DETAIL
SCALE: 1/2" = 1'

IF COMPETENT BEDROCK IS ENCOUNTERED,
DRILL AND EPOXY ROCK ANCHORS, PER
TECHNICAL SPECIFICATIONS

BEDROCK FACE, IF
ENCOUNTERED

APPROVED
FOR CONSTRUCTION

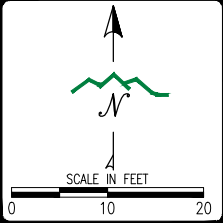
PROPOSED SITE QUANTITIES ENGINEERS ESTIMATE IN BANK VOLUMES ¹			
	CUT (CY)	FILL (CY)	NET (CY)
TYPE C COMPACTED EMBANKMENT FILL ²	30	3056	-3025
A HORIZON ³	384	214	170
CLASS II RIPRAP		458	-458
CLASS III RIPRAP		130	-130
CONCRETE		136	-136

- NOTES:
1. QUANTITIES ARE ENGINEER ESTIMATES. CONTRACTOR IS RESPONSIBLE FOR ESTIMATING BID ITEM QUANTITIES. ACTUAL QUANTITIES MAY VARY FROM THESE ESTIMATED QUANTITIES DEPENDING ON SITE CONDITIONS ENCOUNTERED AT THE TIME THE WORK IS PERFORMED.
 2. INCLUDES STRUCTURAL FILL PLACED AROUND FISH BARRIER AND USED TO CONSTRUCT BERM. ESTIMATED RELATIVE TO EXISTING GROUND.
 3. PLACE MINIMUM 6 INCHES OF A HORIZON (GROWTH MEDIA) ON STRUCTURAL EMBANKMENT AND ANY DISTURBED AREAS THAT WILL NOT BE INUNDATED.

REVISION:	DATE:	BY:	DESC:

DRAWN BY: JJJ
DESIGNED BY: JDE
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APPROVED BY: GEA
PROJECT NO:
DATE: 08/01/2017

DISPLAYED AS:
COORD SYS/ZONE: MSP NAD83
DATUM: NAVD83
UNITS: INT. FEET
SOURCE: PIONEER

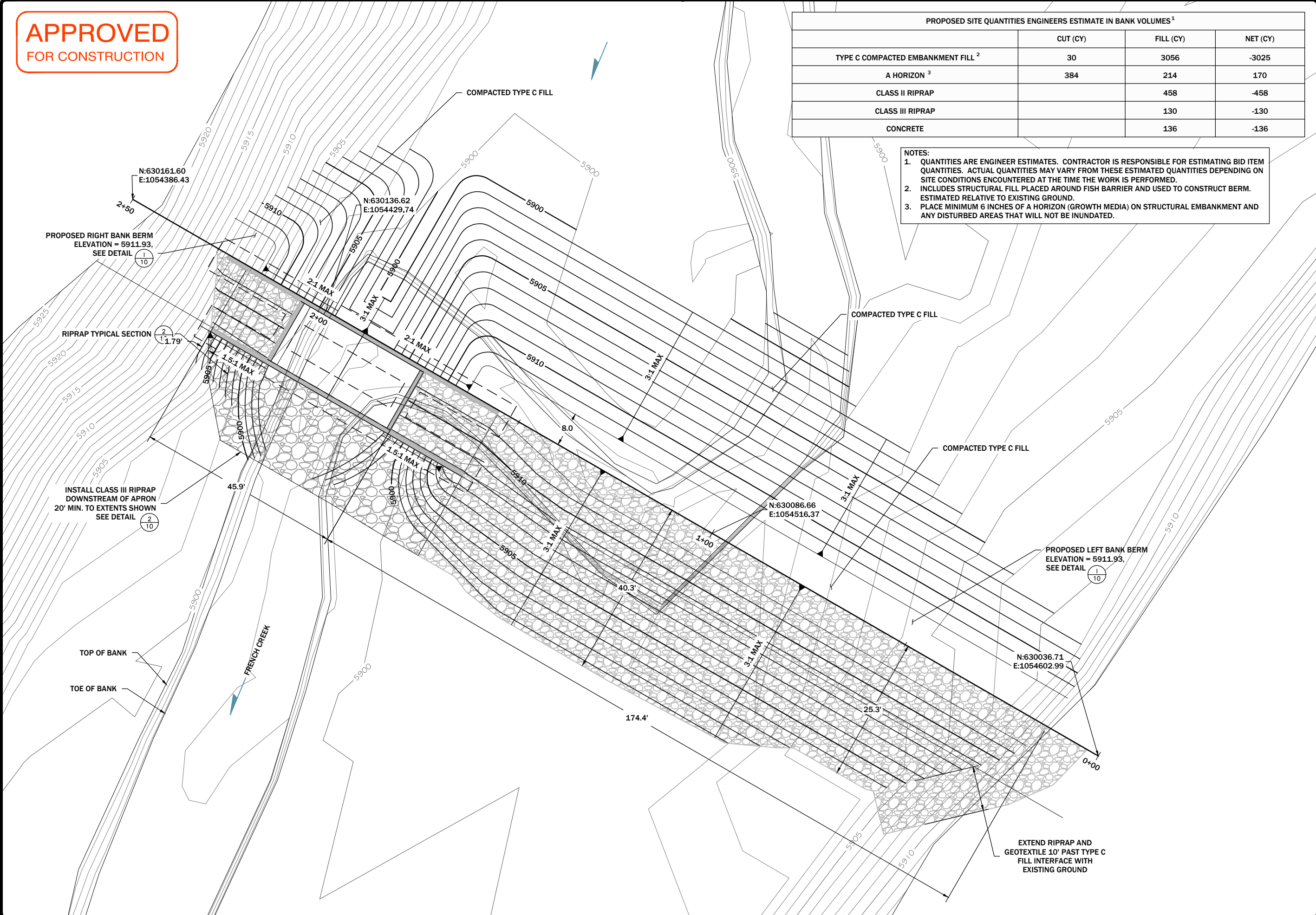


MTFWP
FRENCH CREEK
FISH BARRIER

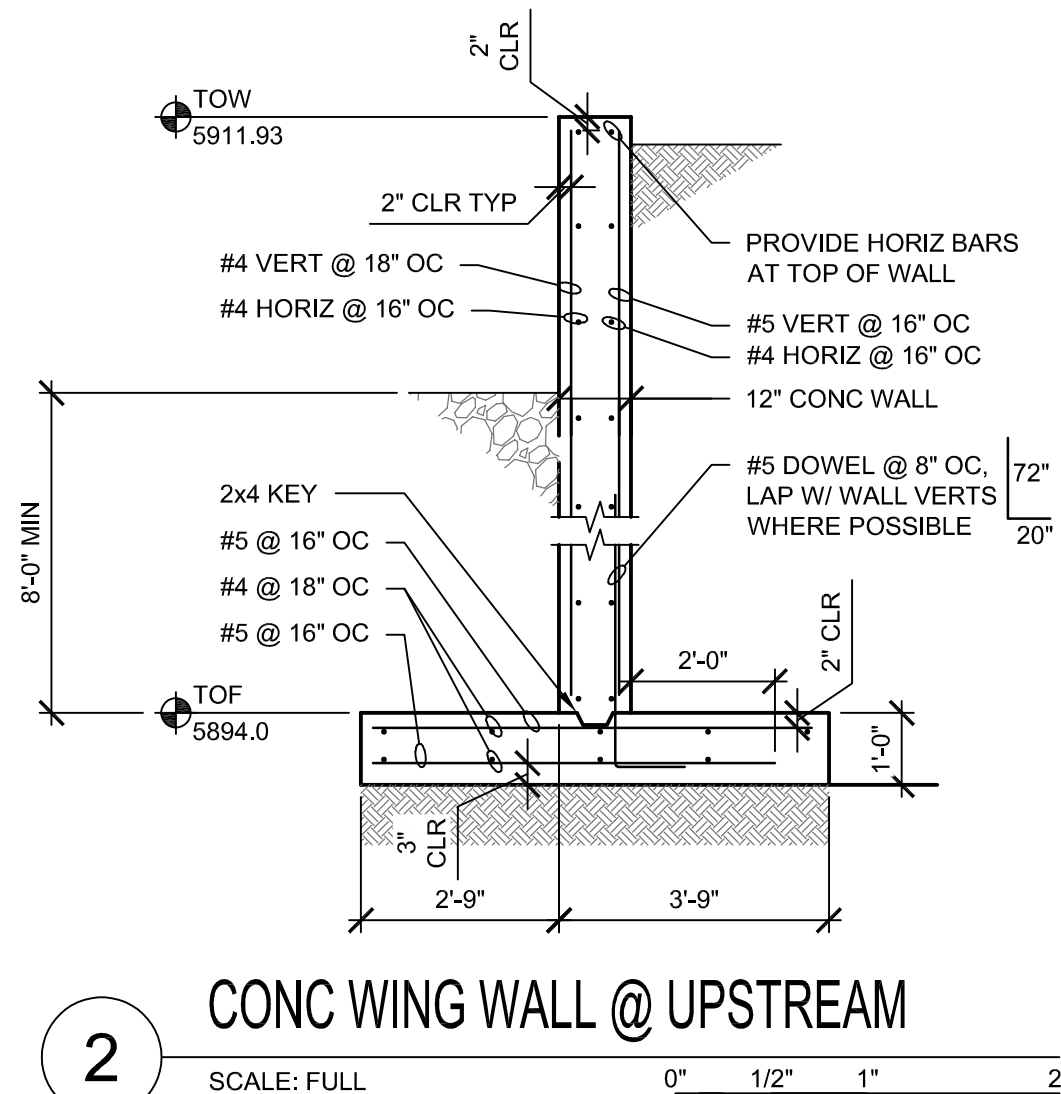
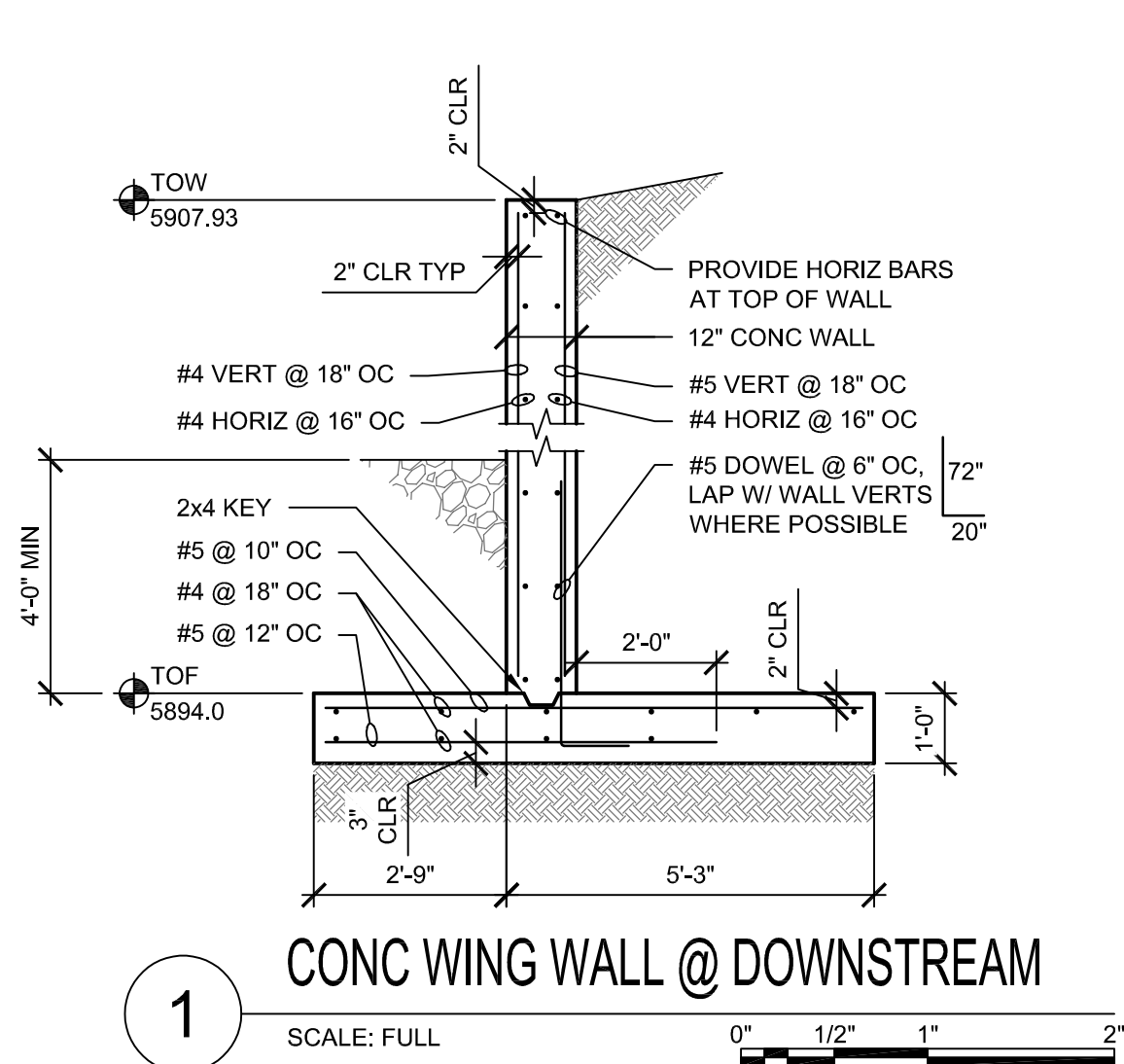
FRENCH CREEK
FISH BARRIER
BACKFILL PLAN



SHEET
7



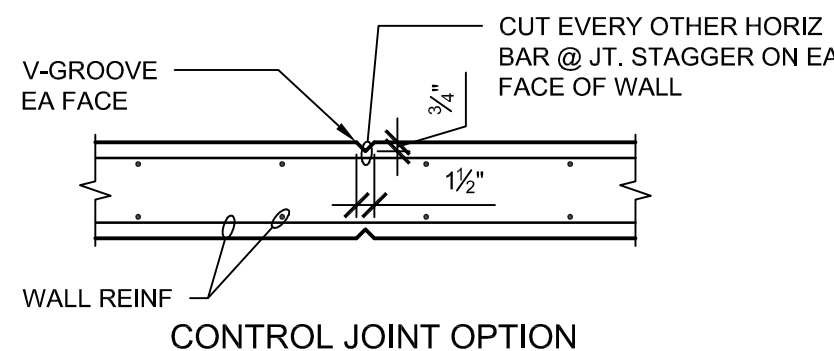
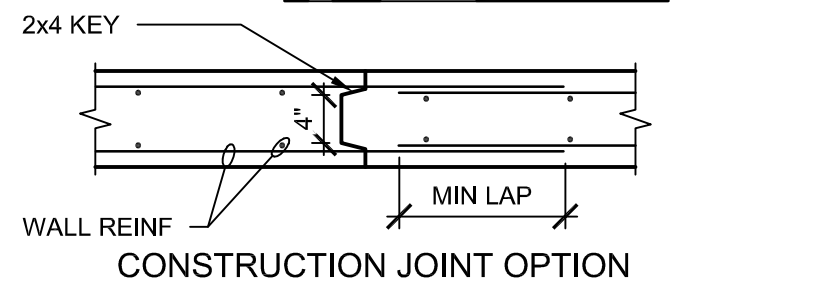
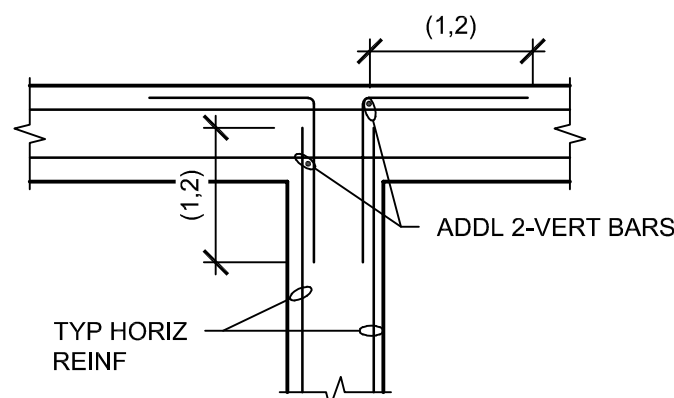
REVISION:	DATE:	BY:	DESC:
DRAWN BY:	JAL		
DESIGNED BY:	JAL		
CHECKED BY:	JAL		
APPROVED BY:	JAL		
PROJECT NO:	17151-0010		
DATE:	6/28/17		
DISPLAYED AS:			
COORD SYS/ZONE:	NA		
DATUM:	NA		
UNITS:	FEET		
SOURCE:	BCE		



MTFWP
FRENCH CREEK
FISH BARRIER

REBAR LAP LEGEND	
BAR DIAMETER	LAP (INCHES)
#3	18"
#4	24"
#5	30"
ADDITIONAL REMARKS:	
1. 4500 PSI CONCRETE CLASS 'B' LAP	

NOTE:
1. INDICATES MIN REBAR LAP LENGTH, SEE DETAIL 3/9
2. REBAR SAME SIZE AND SPACING AS HORIZONTAL BARS



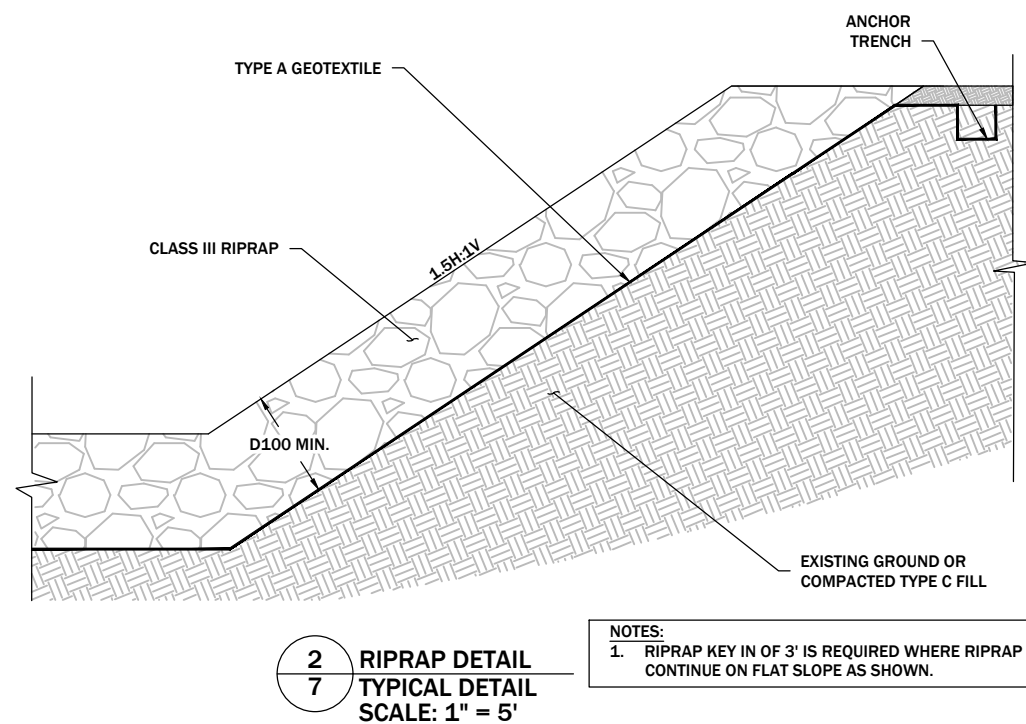
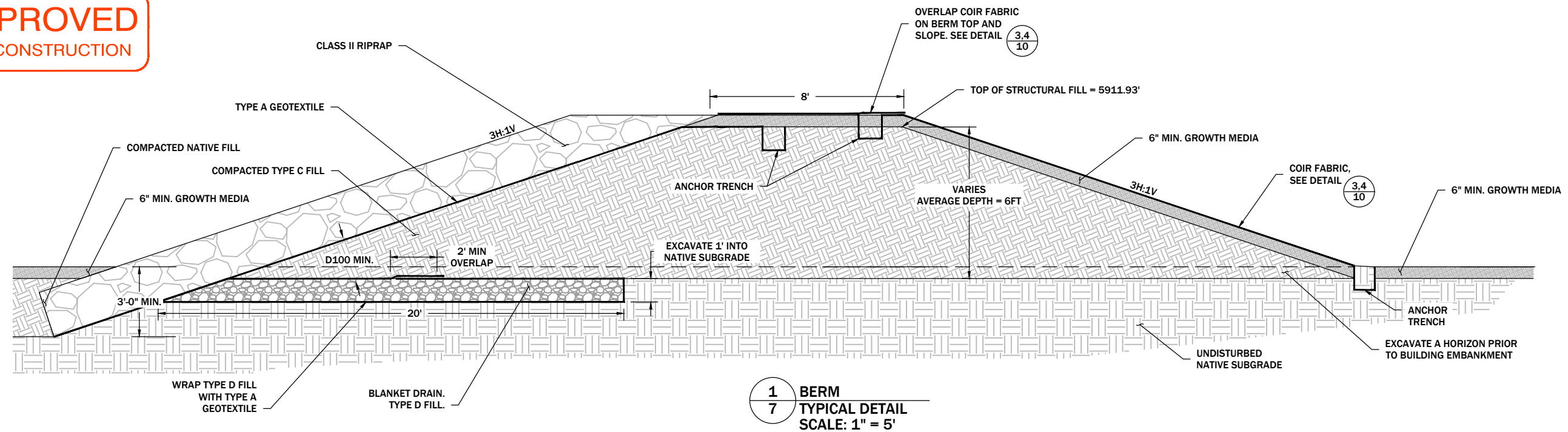
FRENCH CREEK
FISH BARRIER
STRUCTURAL
DETAILS

PIONEER
TECHNICAL SERVICES, INC.
106 PRONGHORN TRAIL SUITE A
BOZEMAN, MONTANA 59718
(406) 388-8579

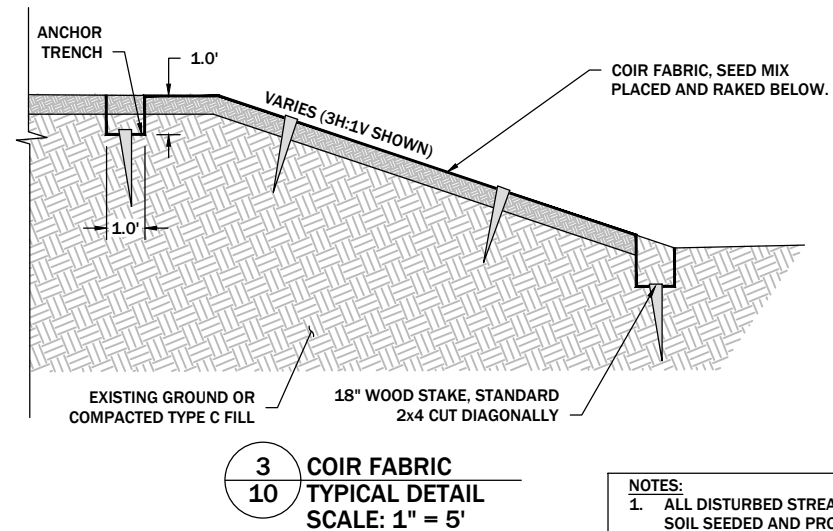
APPROVED
FOR CONSTRUCTION

SHEET
9

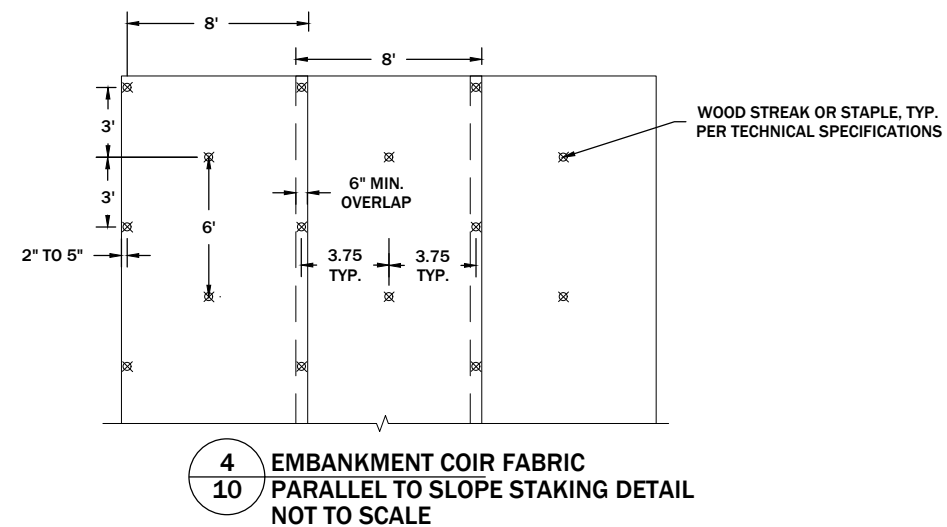
APPROVED
FOR CONSTRUCTION



NOTES:
1. RIPRAP KEY IN OF 3' IS REQUIRED WHERE RIPRAP DOES NOT CONTINUE ON FLAT SLOPE AS SHOWN.



NOTES:
1. ALL DISTURBED STREAM BANKS SHALL BE DRESSED WITH COVER SOIL SEEDED AND PROTECTED WITH COIR FABRIC.



REVISION:	DATE:	BY:	DESC:

DRAWN BY: JJJ
DESIGNED BY: JDE
CHECKED BY: JDE
APPROVED BY: GEA
PROJECT NO: 08/01/2017

DISPLAYED AS:
COORD SYS/ZONE: NA
DATUM: NA
UNITS: FEET
SOURCE: PIONEER

SCALE IN FEET
0 VARIES

MTFWP
FRENCH CREEK
FISH BARRIER

FRENCH CREEK
FISH BARRIER
BACKFILL
DETAILS

PIONEER
TECHNICAL SERVICES, INC.
106 PRONGHORN TRAIL, SUITE A
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SHEET
10